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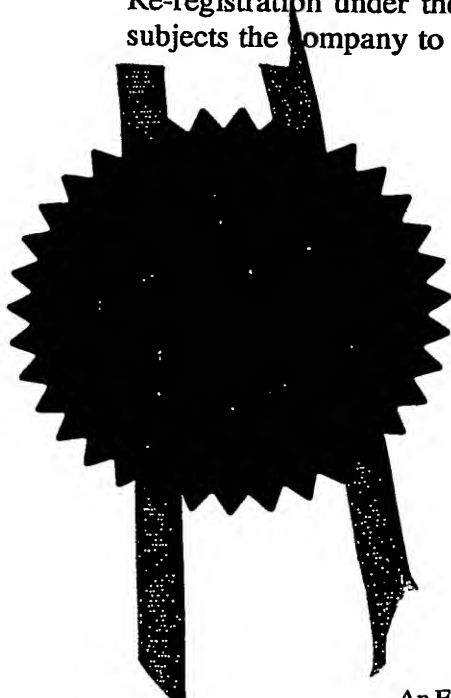
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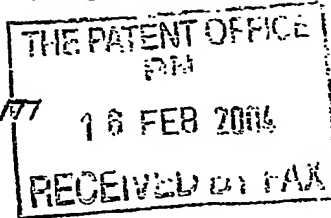
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Dated 1 April 2005

Patents Form 1/77

Patents Act 1977
(Rule 16)16FEB04 E873624-1 002884
P01/7700 0.00-0403365.0 ACCOUNT CHA**Request for grant of a patent**

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

16 FEB 2004

The Patent Office

Cardiff Road
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South Wales
NP10 8QQ

1. Your reference P36589-/SSI/SMI/GEM
2. Patent application number 0403365.0
(The Patent Office will fill this part in)
3. Full name, address and postcode of the or of each applicant (underline all surnames)
Tilda Limited
Coldharbour Lane
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RM13 9YQ
Patents ADP number (if you know it) 07565591001
If the applicant is a corporate body, give the country/state of its incorporation United Kingdom
4. Title of the invention "Packaging for Foodstuffs and a Method of Packaging Same"
5. Name of your agent (if you have one) SCEPTRE
"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)
Scotland House
165-169 Scotland Street
Glasgow
G5 8PL
Patents ADP number (if you know it) 07047095002
6. Priority: Complete this section if you are declaring priority from one or more earlier patent applications, filed in the last 12 months.
- | Country | Priority application number (if you know it) | Date of filing (day / month / year) |
|----------------|--|-------------------------------------|
| United Kingdom | | |
7. Divisionals, etc: Complete this section only if this application is a divisional application or resulted from an entitlement dispute (see note d)
- | Number of earlier UK application | Date of filing (day / month / year) |
|----------------------------------|-------------------------------------|
| | |
8. Is a Patents Form 7/77 (Statement of inventorship and of right to grant of a patent) required in support of this request?
Answer YES if
a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
Otherwise answer NO (See note d) Yes

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9. Accompanying documents: A patent application must include a description of the invention. Not counting duplicates, please enter the number of pages of each item accompanying this form:

Continuation sheets of this form

Description

9

Claim(s)

Abstract

Drawing(s)

1

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for a preliminary examination and search (Patents Form 9/77)

Request for a substantive examination (Patents Form 10/77)

Any other documents (please specify)

11. I/We request the grant of a patent on the basis of this application.

Signature(s)

Graham Murnane

Date 16/02/2004

12. Name, daytime telephone number and e-mail address, if any, of person to contact in the United Kingdom

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Notes

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- If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
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- Part 7 should only be completed when a divisional application is being made under section 15(4), or when an application is being made under section 8(3), 12(6) or 37(4) following an entitlement dispute. By completing part 7 you are requesting that this application takes the same filing date as an earlier UK application. If you want the new application to have the same priority date(s) as the earlier UK application, you should also complete part 6 with the priority details.

1 Packaging for Foodstuffs and a Method of Packaging

2 Same

3

4 The present invention relates to packaging for
5 foodstuffs and particularly, but not exclusively, to
6 cereal based foodstuffs and a method of packaging
7 same within flexible-walled containers.

8

9 Modified Atmosphere Packaging (MAP) of food products
10 in a variety of pack formats and materials is a
11 longstanding technique used to reduce the
12 atmospheric air content of a sealed pack. By
13 reducing the oxygen content of a sealed pack the
14 shelf life of the product can be significantly
15 increased by delaying the onset of oxidative
16 rancidity, particularly in products containing oils.

17

18 The availability of gusseted plastics laminate
19 pouches with appropriate barrier properties has
20 enabled the development of Pre-Cooked Ambient (PCA)
21 products. Suitable pouches can (i) withstand
22 conventional full sterilisation retort processes;

1 (ii) retain very low oxygen and moisture
2 permeability after the retort process; and (iii)
3 allow foodstuffs to be reheated in a microwave oven.
4 Many foodstuffs such as rice, noodles, pasta, sauces
5 and petfood containing small quantities of oil
6 currently use MAP and consequently benefit from
7 ambient shelf lives of 12-18 months.

8
9 The MAP process involves filling the pouches with a
10 foodstuff and flushing the pouches with inert gases
11 (such as nitrogen and carbon dioxide) to remove
12 their oxygen content. The inert gas or gas mixture
13 inhibits proliferation of some micro-organisms
14 (moulds and bacteria) with no significant chemical
15 alteration of the product. The pouches are then
16 mechanically squeezed to remove substantially all of
17 the gas mixture and then sealed to achieve a
18 residual oxygen content of typically below 2% and
19 ideally below 1%. After sealing the pouch is
20 subjected to the full retort sterilisation process.

21
22 In the packaging of rice, noodles, pasta and related
23 recipe products (an example of which is egg fried
24 rice containing discrete pieces of scrambled egg and
25 peas), the purging of gases from within a pouch
26 during the MAP process results in the compression
27 and agglomeration of the foodstuff. Using rice as
28 an example, agglomeration of the separate grains
29 means that the product suffers in a presentational
30 sense and is somewhat unappealing to the consumer.

31

3

1 According to the present invention there is provided
2 a partially inflated flexible-walled container for
3 foodstuffs, said container being partially inflated
4 by an inert gas.

5

6 Preferably, the container contains a foodstuff.

7

8 Preferably, the foodstuff is cereal based.

9

10 Preferably, the cereal is selected from the group
11 consisting of rice, couscous, wild rice, barley,
12 wheat, oats, rye, millet and maize.

13

14 Most preferably, the cereal is rice.

15

16 Preferably, the flexible-walled container is a
17 plastics pouch.

18

19 Preferably, the plastics pouch is gusseted.

20

21 Preferably, the plastics pouch is formed from
22 microwaveable material.

23

24 Preferably, the inert gas is selected from the group
25 consisting of nitrogen, carbon dioxide, helium,
26 argon, neon and xenon.

27

28 Most preferably, the inert gas is nitrogen.

29

30 Preferably, oxygen gas forms less than 2% of the
31 volume of gas within the container.

32

1 Most preferably, oxygen gas forms less than 1% of
2 the volume of gas within the container.

3

4 Preferably, the volume of inert gas within the
5 container is selected to reduce agglomeration of
6 discrete pieces of the foodstuff.

7

8 Preferably, the volume of inert gas within the
9 container increases is selected to increase the
10 overall volume of the container by at least 5%.

11

12 According to a second aspect of the present
13 invention there is provided a method of filling a
14 container according to the first aspect comprising
15 the steps of:

16 (i) introducing a foodstuff into a flexible-
17 walled container;

18 (ii) purging substantially all oxygen from the
19 container by flushing it with an inert gas;

20 (iii) sealing the container.

21

22 Preferably, the step of purging oxygen from the
23 container involves introducing a selected volume of
24 inert gas into the container such that the container
25 is inflated by the inert gas.

26

27 Preferably, the container subsequently has its
28 internal volume reduced such that the container is
29 partially inflated by the inert gas.

30

31 Preferably, the step of sealing the container is
32 performed whilst the container is partially inflated

1 to thereby retain a selected volume of inert gas
2 therein.

3

4 Preferably, the step of sealing the container is
5 achieved by heat sealing.

6

7 Embodiments of the present invention will now be
8 described, by way of example only, with reference to
9 the following drawings in which:

10

11 Fig. 1 is a flow diagram showing the packaging
12 process of the present invention; and

13

14 Fig. 2 is a table showing the relative
15 characteristics of conventional pouches filled using
16 both conventional means and by the method of the
17 present invention.

18

19 Fig. 1 outlines the various production line stages
20 involved in implementing the method of filling
21 pouches.

22

23 Step 1: The first stage involves picking up and
24 holding a pouch at its top corners in the
25 conventional way. At this point, the gusset at the
26 base of the pouch is in a folded state such that the
27 whole pouch is in a substantially flat orientation.

28

29 Step 2: The second stage involves mechanically
30 separating the walls of the unsealed end of the
31 pouch and introducing nitrogen gas therein. The
32 nitrogen gas acts to increase the pressure within

1 the pouch and therefore unfolds the gusset into
2 deployment.

3

4 Step 3: For the case of solid foodstuffs (or a
5 mixture of solids and liquids), these are introduced
6 into the opened pouch whilst the flow of nitrogen
7 gas is maintained. This step ensures that oxygen is
8 flushed from the pouch before being trapped by the
9 foodstuff.

10

11 Step 4: If the foodstuff is entirely liquid then no
12 gas is introduced concurrently with the foodstuff.

13

14 Step 5: Once the foodstuff (whether solid or liquid
15 or both) is introduced into the pouch, a flat nozzle
16 is inserted into its unsealed end. The walls of the
17 unsealed end are pulled tight against the nozzle
18 which then inflates the pouch with nitrogen gas.
19 Once the pouch is inflated, the flat nozzle is
20 removed from the pouch.

21

22 Step 6: The pouch is squeezed in a controlled manner
23 thus removing a selected volume of nitrogen gas and
24 reducing the overall volume of the pouch. Once the
25 pouch reaches the desired volume, the unsealed end
26 is heat sealed. The desired volume will vary
27 depending upon the amount and type of foodstuff
28 being packaged.

29

30 Step 7: The pouch then undergoes the full retort
31 sterilisation process wherein trays of pouches are
32 transferred into a conventional overpressure retort

1 and subjected to a thermal process (either static or
2 rotational) designed to achieve commercial sterility
3 appropriate to the nature of the contents (e.g. 6
4 minutes at 121°C for rice products). Retort
5 temperatures must not exceed those specified by
6 pouch manufacturers (normally 130°C).

7
8 Alternatively, neither, either or both of steps 2
9 and 3 are used in combination with step 5 to achieve
10 the required level of oxygen in the sealed pouch
11 which will be dependent on the nature of its
12 contents. Step 6 controls the final volume of the
13 pouch.

14
15 Depending upon the nature of the pouch contents,
16 either or both of steps 3 and 4 are implemented.

17
18 It will be appreciated by those skilled in the art
19 that the preceding steps have the following
20 important benefits and improvements. In view of the
21 fact that the pouch is sealed whilst retaining a
22 selected volume of gas, the consumer's perception is
23 that the partially inflated pouch looks less rigid,
24 less processed and has an overall enhanced on-shelf
25 appeal.

26
27 Moreover, in the conventional packaging process,
28 pouches are squeezed to remove substantially all gas
29 to reduce the volume of the pouches to that of their
30 contents. Accordingly, when emptying conventionally
31 packaged pouches the contents are often lumpy and
32 unappealing to the consumer. The consumer is

1 compelled to squeeze the pouch during or subsequent
2 to emptying its contents in order to break up and
3 separate the agglomerated foodstuff. However, the
4 partial inflation of the pouch of the present
5 invention reduces agglomeration of its contents and
6 promotes conditions wherein the foodstuff retains
7 its original and familiar characteristics. For
8 example, in the case of rice, the grains remain
9 light, fluffy and separated.

10

11 Fig. 2 demonstrates the increased volume of pouches
12 packaged using the method of the present invention
13 using the mean volume of a conventionally packaged
14 pouch as a reference. As discussed previously,
15 conventionally packaged pouches retain substantially
16 no gas after they are sealed and their volume is
17 therefore substantially equal to the volume of their
18 contents.

19

20 The mean volume of pouches (of equal width/height
21 and containing the same weight/type of foodstuff)
22 filled by the packaging method of the present
23 invention is, in the present non-limiting example
24 shown in Fig. 2, at least 11.4% greater than the
25 conventionally packaged reference pouch.

26

27 Depending upon the nature of the foodstuff contained
28 within the partially inflated pouch, the increase in
29 volume over that of the reference is adapted to be
30 at least 5%.

31

1 Accordingly, it will be further appreciated by those
2 skilled in the art that such an increase in volume
3 is beneficial in terms of reducing the pressure
4 applied to the foodstuff by the walls of the
5 container. Therefore, the likelihood of
6 agglomeration of, for example, cereal grains during
7 the retort sterilisation process and during storage,
8 distribution and use is substantially reduced.
9 Maintaining separate free flowing cereal grains is a
10 critical quality parameter making the product more
11 appealing to the consumer and is absent in
12 foodstuffs made using conventional processes.
13
14 Modifications and improvements may be made without
15 departing from the scope of the present invention.
16 For example, the flexible walled container may be
17 made from a non-microwavable foil-based material or
18 from a material suitable for boil-in-bag cooking.

FIG. 1

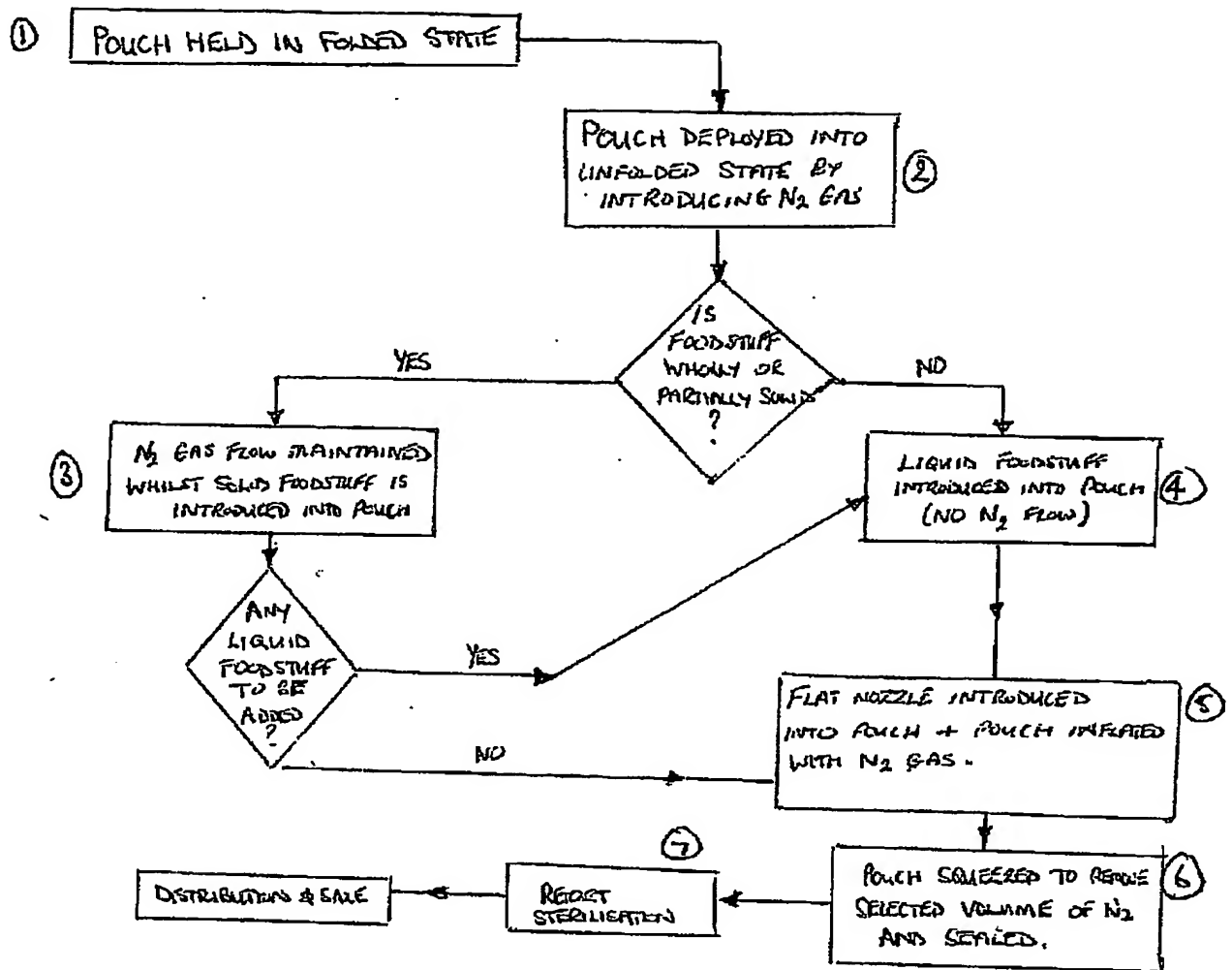


FIG. 2.

PROCESS	CONVENTIONAL	PRESENT INVENTION.
POUCH DIMENSIONS	140 x 185 mm	140 x 185 mm
POUCH + CONTENTS WEIGHT	250g	250g
TOTAL POUCHES MEASURED	20	23
MEAN VOLUME	463 ml (Reference)	533 ml (+15.1%)
MINIMUM VOLUME	446 ml (-3.6%)	516 ml (+11.4%)
MAXIMUM VOLUME	476 ml (+2.8%)	560 ml (+20.1%)

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